



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,397	09/11/2006	Soren Louis Pedersen	GRP-0125	2268
23413 7590 01/23/2009 CANTOR COLBURN, LLP 20 Church Street 22nd Floor Hartford, CT 06103				
EXAMINER				
ELBIN, JESSE A				
ART UNIT		PAPER NUMBER		
2614				
NOTIFICATION DATE		DELIVERY MODE		
01/23/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

# Office Action Summary

**Application No.**

10/538,397

**Applicant(s)**

PEDERSEN ET AL.

**Examiner**

JESSE A. ELBIN

**Art Unit**

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
- Paper No(s)/Mail Date See Continuation Sheet
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :9 June 2005; 8 September 2005; 1 June 2007.

## **DETAILED ACTION**

### ***Response to Amendment***

1. The preliminary amendment received June 9, 2006 has been entered.

### ***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

### ***Claim Objections***

3. Claim 3 is objected to because the amendment to remove the alternative dependency of claim 3 did not strike one of the two claim numbers (i.e. "claim 1-or-claim 2" results in "claim 12"). For the purposes of the art rejection below, claim 3 will be interpreted as being dependent upon claim 1. Appropriate correction is required.

4. Claim 25 is objected to for having improper antecedent basis for the phrase "said test word". For the purposes of the art rejection below, claim 25 will be interpreted as being dependent upon claim 24 (based on the similarity of claims 9-11 with claims 24-26).
5. Claims 14, 32, and 46 are objected to for the use of non-standard decimal notation (i.e. "1,5 octave"). For the purposes of the art rejection below, "1,5" will be interpreted at "1.5". Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1-63 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims are all drawn toward method steps which are neither 1) tied to a particular machine or apparatus, or 2) transform a particular article to a different state or thing. Two steps of "determining [a] perceptual reference level" are claimed in claim 1; however there is no 'particular machine or apparatus' nor is there a transformation of 'a particular article to a different state or thing'. Dependent claims 2-40 further define the steps of "determining" but do not remedy the deficiencies of claim 1 under the "machine or transformation test".
8. Similarly, independent claim 41 includes steps of "evaluating" and "adjusting said signal processing parameters", which do not inherently or expressly require a "particular machine or apparatus" nor "transform a particular article to a different state or thing". The step of "adjusting said signal processing parameters" implies a transformation of an

audio input signal; however there is no positive recitation of a particular machine or apparatus to perform the processing, and no recitation of the steps needed to input and output said signal.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-4, 6, 7, 20-22, 27, 30, 31, and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Hochmair et al. (US Patent 4,577,641 ('641)).

**Regarding claim 1**, Hochmair teaches a method of adapting signal processing characteristics of a portable communication device to a hearing impaired user ("fitting hearing prosthesis to a patient having impaired hearing"; '641 title), comprising: determining a perceptual reference level (PRL) (e.g. "threshold", "most comfortable loudness", or "threshold of discomfort"; '641 Fig. 2) of a first stimuli signal (FSS) in a reference frequency band (RFB) by presenting said first stimuli signal (FSS) to said hearing impaired user (e.g. *the first frequency of the* "frequenc[ies]...swept from 100Hz to 3160 Hz in 90 logarithmically equally spaced frequency steps"; '641 col. 3 lines 64-66), and obtaining perceptual judgements of a loudness of said first stimuli signal (FSS) from said hearing impaired user ("The user can then use both the visual and audio stimulation to determine his response to the signal"; '641 col. 4 lines 9-10), and

determining said perceptual reference level (PRL) of a second stimuli signal (SSS) in a further frequency band (FFB) (*wherein the further frequency band is any set of frequencies in the sweep not including the "first" signal*) by presenting said second stimuli signal (SSS) (*wherein the "second stimuli signal" is any set signal of the sweep of frequencies subsequent to the "first" signal*) to said hearing impaired user (e.g. *another frequency of the "frequent[ies]...swept from 100Hz to 3160 Hz"*), and requesting said hearing impaired user to compare a loudness of said second stimuli signal (SSS) with said loudness of said first stimuli signal (FSS) ("One preferred end result is the establishment of a generally uniform response, in loudness and quality, by the patient to input signals across the frequency spectrum of interest"; '641 col. 4 lines 12-15).

**Regarding claim 2**, Hochmair remains as applied above.

Hochmair further teaches said portable communication device being a hearing aid ("hearing prosthesis"; '641 title).

**Regarding claim 3**, Hochmair remains as applied above.

Hochmair further teaches said portable communication device comprising compensation means for compensation of hearing loss ("hearing prosthesis"; '641 title).

**Regarding claim 4**, Hochmair remains as applied above.

Hochmair further teaches a most comfortable level (MCL) being used for said perceptual reference level (PRL) ("establishment of a generally uniform response...by the patient...at most comfortable loudness"; '641 col. 4 lines 12-16).

**Regarding claim 6**, Hochmair remains as applied above.

Hochmair further teaches said first stimuli signal (FSS) comprises periodic signals ("generated signals are preferably a continuous sinusoidal wave"; '641 col. 3 lines 61-63) and/or frequency band limited noise ("bandfiltered noise...can be used"; '641 col. 4 lines 22, 24).

**Regarding claim 7**, Hochmair remains as applied above.

See rejection of claim 6 wherein Hochmair teaches use of both "sinusoidal wave" sounds and "bandfiltered noise".

**Regarding claim 20**, Hochmair remains as applied above.

Hochmair further teaches letting the user vary a sound pressure level (SPL) of the first stimuli signal (FSS) until said perceptual reference level (PRL) is achieved ("frequency response adjustment means is used by the patient...for varying the frequency response to obtain a response which is generally uniform in loudness"; '641 col. 2 lines 16-20).

**Regarding claim 21**, Hochmair remains as applied above.



Hochmair further teaches said second stimuli signal (SSS) (*wherein the 'SSS' is a subsequent signal in the frequency sweep taught by Hochmair*) comprising periodic signals ("generated signals are preferably a continuous sinusoidal wave"; '641 col. 3 lines 61-63) and/or frequency band limited noise ("bandfiltered noise...can be used"; '641 col. 4 lines 22, 24).

**Regarding claim 22**, Hochmair remains as applied above.

See rejection of claim 21 above, wherein Hochmair teaches the 'SSS' being "a sound".

**Regarding claim 27**, Hochmair remains as applied above.

Hochmair further teaches said second stimuli signal (SSS) (i.e. *stimulus signals of a frequency in the taught 'sweep' subsequent to the first signal*) is of a kind similar to said first stimuli signal (FSS) (*wherein the two stimulus signals taught by Hochmair differ only in frequency*).

**Regarding claim 30**, Hochmair remains as applied above.

Hochmair teaches a sweep of frequencies from 100 Hz to 3160 Hz wherein one of ordinary skill in the art would recognize any of the frequencies could be considered a "first stimulus signal" (e.g. 100 Hz) and any subsequent signal in the sweep to be a "second stimulus signal". Therefore the dividing line between "first" and "second" is

arbitrary, and the resulting "reference frequency band" would inherently differ from the "further frequency band".

**Regarding claim 31**, Hochmair remains as applied above.

Hochmair further teaches the step of determining (claim 1) is repeated with several substantial mutually exclusive ("generating the signal in steps"; '641 col. 4 lines 3-4) said further frequency bands ("90 logarithmically equally spaced frequency steps"; '641 col. 3 lines 65-66).

**Regarding claim 40**, Hochmair remains as applied above.

Hochmair further teaches said comparing a loudness of said second stimuli signal (SSS) with said loudness of said first stimuli signal (FSS), is performed to establish equal loudness ("One preferred end result is the establishment of a generally uniform response, in loudness and quality"; '641 col. 4 lines 12-14).

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 5, 8, 12-19, 23, 28, 29 and 32-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hochmair et al. (US Patent 4,577,641 ('641)) as applied to claim 1 above.

**Regarding claim 5**, Hochmair remains as applied above.

Hochmair further teaches an uncomfortable level (UCL) [can also be] used for said perceptual reference level (PRL) ("The adjustments can also be made at hearing threshold and at threshold of discomfort"; '641 col. 2 lines 22-24) for the benefit of establishing a dynamic range of hearing.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the single 'MCL' measurement taught by Hochmair with the threshold and discomfort level measurements also taught by Hochmair For the purposes of the art rejection below, of establishing a dynamic range of hearing of the patient.

**Regarding claim 8**, Hochmair remains as applied above.

See rejection of claim 1 above, where Hochmair teaches said first stimuli signal (FSS) comprises a sequence of sounds ("frequenc[ies]...swept from 100Hz to 3160 Hz in 90 logarithmically equally spaced frequency steps"; '641 col. 3 lines 64-66).

**Regarding claim 12,** Hochmair remains as applied above.

See rejection of claim 1 above, wherein Hochmair teaches the said reference frequency band (RFB) is a sub-band of an audible frequency band ("frequenc[ies]...from 100 Hz to 3160 Hz"; '641 col. 3 lines 64-66).

**Regarding claim 13,** Hochmair remains as applied above.

See rejection of claim 1 above, wherein Hochmair teaches said reference frequency band (RFB) is a sub-band of a frequency band from 100 Hz to 10 kHz ("100 Hz to 3160 Hz").

**Regarding claim 14,** Hochmair remains as applied above.

See rejection of claim 1 above, wherein Hochmair teaches said reference frequency band (RFB) has a width of 1.5 octave[s] (100Hz *approximately corresponds to note G<sub>2</sub> wherein 3160 Hz approximately corresponds to note G<sub>7</sub>, spanning approximately 5 octaves.*)

**Regarding claim 15,** Hochmair remains as applied above.

See rejection of claim 14 above, wherein Hochmair teaches said reference frequency band (RFB) has a width of one octave.

**Regarding claim 16,** Hochmair remains as applied above.

See rejection of claim 14 above, wherein Hochmair teaches said reference frequency band (RFB) has a width of 2/3 octave.

**Regarding claim 17,** Hochmair remains as applied above.

See rejection of claim 14 above, wherein Hochmair teaches said reference frequency band (RFB) has a width of 1/3 octave.

**Regarding claim 18,** Hochmair remains as applied above.

See rejection of claim 1 above, wherein Hochmair teaches said reference frequency band (RFB) is a band from 500 Hz to 1 kHz ("100 Hz to 3160 Hz").

**Regarding claim 19,** Hochmair remains as applied above.

See rejection of claim 1 above, wherein Hochmair teaches said reference frequency band (RFB) is a band from 250 Hz to 800 Hz ("100 Hz to 3160 Hz").

**Regarding claim 23,** Hochmair remains as applied above.

See rejection of claims 1 and 8 above, where Hochmair teaches said second stimuli signal (SSS) comprises a sequence of sounds ("frequenc[ies]...swept from

100Hz to 3160 Hz in 90 logarithmically equally spaced frequency steps"; '641 col. 3 lines 64-66).

**Regarding claim 28**, Hochmair remains as applied above.

Hochmair further teaches said further frequency band (FFB) is a sub-band of an audible frequency band ("100 Hz to 3160 Hz" *wherein arbitrarily dividing the band into a "reference frequency band" and "further frequency band" still results in the "FFB" being a sub-band of an audible range*).

**Regarding claim 29**, Hochmair remains as applied above.

Hochmair further teaches said further frequency band (FFB) is a sub-band of a frequency band from 100 Hz to 10 kHz ("100 Hz to 3160 Hz" *wherein arbitrarily dividing the band into a "reference frequency band" and "further frequency band" still results in the "FFB" being a band "from 100 Hz to 10 kHz"*).

**Regarding claim 32**, Hochmair remains as applied above.

Hochmair teaches the entire frequency band being tested being from 100 Hz ( $G_2$ ) to 3160 Hz ( $G_7$ ); wherein one of ordinary skill would know placement of the arbitrary boundary between "reference frequency band" and "further frequency band" at about 1 kHz would produce two separate bands, both having a width greater than 1.5 octaves.

**Regarding claim 33**, Hochmair remains as applied above.

See rejection of claim 32 above.

**Regarding claim 34**, Hochmair remains as applied above.

See rejection of claim 32 above.

**Regarding claim 35**, Hochmair remains as applied above.

See rejection of claim 32 above.

**Regarding claim 36**, Hochmair remains as applied above.

Hochmair teaches the entire sweeping 90 frequencies in a frequency band from 100 Hz (G<sub>2</sub>) to 3160 Hz (G<sub>7</sub>); wherein defining a boundary and naming one group a "reference frequency band" and another group a "further frequency band" is arbitrary. As such, Hochmair teaches a band from 100 Hz to 3160 Hz, wherein an example arbitrary boundary may exist at roughly 1 kHz, creating a "further frequency band between 100 Hz and 1 kHz ("a band from 100 Hz to 500 Hz").

**Regarding claim 37**, Hochmair remains as applied above.

Hochmair teaches the entire sweeping 90 frequencies in a frequency band from 100 Hz (G<sub>2</sub>) to 3160 Hz (G<sub>7</sub>); wherein defining a boundary and naming one group a "reference frequency band" and another group a "further frequency band" is arbitrary. As such, Hochmair teaches a band from 100 Hz to 3160 Hz, wherein an example

arbitrary boundary may exist at roughly 1 kHz, creating a "further frequency band between 100 Hz and 1 kHz ("a band from 250 Hz to 500 Hz").

**Regarding claim 38**, Hochmair remains as applied above.

Hochmair teaches the entire sweeping 90 frequencies in a frequency band from 100 Hz (G<sub>2</sub>) to 3160 Hz (G<sub>7</sub>); wherein defining a boundary and naming one group a "reference frequency band" and another group a "further frequency band" is arbitrary. As such, Hochmair teaches a band from 100 Hz to 3160 Hz, wherein an example arbitrary boundary may exist at roughly 2 kHz, creating a "further frequency band between 100 Hz and 2 kHz ("a band from 1 kHz to 2 kHz").

**Regarding claim 39**, Hochmair remains as applied above.

Hochmair further teaches the band of frequencies of 100 Hz to 3160 Hz being exemplary ("an audio range such as from 100 Hz to 3160 Hz"; '641 col. 2 lines 13-14), as well as 'Audio Band' is defined as "between the range of 10 Hz and 17 kHz" ('641 col. 3 lines 7-10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the exemplary range taught by Hochmair with an extended range as suggested by Hochmair based on the requirements of the design and the specific needs of the patient being tested.

Hochmair teaches the entire sweeping 90 frequencies in a frequency band from 100 Hz (G<sub>2</sub>) to 3160 Hz (G<sub>7</sub>); wherein defining a boundary and naming one group a



"reference frequency band" and another group a "further frequency band" is arbitrary. As such, Hochmair teaches a band from 100 Hz to 3160 Hz, wherein an example arbitrary boundary may exist at roughly 1 kHz, creating a "further frequency band between 1 kHz to 3160 Hz ("a band from 2 kHz to 4 kHz").

14. Claims 9-11, 24-26, and 41-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hochmair et al. (US Patent 4,577,641 ('641)) in view of Franklin (US Patent 4,139,730 ('730)).

**Regarding claim 9**, Hochmair remains as applied above.

Hochmair does not explicitly teach said sound being a test word.

In the same field of endeavor, Franklin teaches a sound being a test word ("In one embodiment of the process, the phrase 'Ah, ah, baby, clap, clap, clap, clap,' spoken by a female, has been used as the speech pattern"; '730 col. 2 lines 28-30) for the benefit of determining loudness levels across certain frequencies using actual words.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the comfort level measurements taught by Hochmair with the use of spoken phrases as taught by Franklin for the benefit of determining loudness levels across certain frequencies using actual words.

**Regarding claim 10**, Hochmair and Franklin remain as applied above.

Franklin further teaches said test word having a spectral energy content of which an effective part is within said reference frequency band (RFB) ("This speech pattern was filtered using various low-frequency cutoff points of 250, 500, 1000, 2000, and 4000 Hz"; '730 col. 2 lines 33-34 *wherein the RFB taught by Hochmair is in the range of* "100Hz to 3160 Hz").

**Regarding claim 11**, Hochmair and Franklin remain as applied above.

Franklin further teaches said test word is chosen according to everyday word usage of said hearing impaired user (*while Franklin teaches one specific phrase used as an example, Franklin states "use of familiar words and phonemes provides test results which reflect more accurately the frequencies at which amplification assistance is desired and the extent of such assistance"; '730 col. 1 lines 44-47).*

**Regarding claim 24**, Hochmair remains as applied above.

Hochmair does not explicitly teach said sound of said second stimuli signal (SSS) being a test word.

In the same field of endeavor, Franklin teaches a sound being a test word ("In one embodiment of the process, the phrase 'Ah, ah, baby, clap, clap, clap, clap,' spoken by a female, has been used as the speech pattern"; '730 col. 2 lines 28-30) for the benefit of determining loudness levels across certain frequencies using actual words.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the second stimuli signal taught by Hochmair with the use of spoken

phrases as taught by Franklin for the benefit of determining loudness levels across certain frequencies using actual words.

**Regarding claim 25**, Hochmair and Franklin remain as applied above.

See rejection of claim 10 above, where Franklin teaches spectral content of test words.

**Regarding claim 26**, Hochmair and Franklin remain as applied above.

See rejection of claim 11 above, where Franklin teaches using words familiar with the patient in the testing.

**Regarding claim 41**, Hochmair teaches a method of adapting signal processing characteristics of a portable communication device to a hearing impaired user ("fitting hearing prosthesis to a patient having impaired hearing"; '641 title), comprising: evaluating a hearing impairment of said hearing impaired user ("a frequency sweep of the sound processor input is used for adjustment of frequency response to the patient's particular needs"; '641 col. 2 lines 5-7) by presenting at least one stimuli signal (SS) (e.g. *the first frequency of the* "frequenc[ies]...swept from 100Hz to 3160 Hz in 90 logarithmically equally spaced frequency steps"; '641 col. 3 lines 64-66) to said hearing impaired user, and obtaining perceptual judgements of a predetermined attribute of said at least one stimuli signal (SS) from said hearing impaired user ("The user can then use both the visual and audio stimulation to determine his response to the signal"; '641 col.

4 lines 9-10), and adjusting said signal processing parameters of said portable communication device according to said perceptual judgements of said at least one stimuli signal (SS) ("frequency response adjustment means is used by the patient or operator for varying the frequency response to obtain a response which is generally uniform in loudness"; '641 col. 2 lines 16-20).

Hochmair does not explicitly teach said at least one stimuli signal (SS) comprising a set of test words, said test words each having a spectral energy content of which an effective part is within one restricted frequency band selected from a set of restricted frequency bands.

In the same field of endeavor, Franklin teaches a stimuli signal (SS) comprising a set of test words ("In one embodiment of the process, the phrase 'Ah, ah, baby, clap, clap, clap, clap,' spoken by a female, has been used as the speech pattern"; '730 col. 2 lines 28-30) said test words each having a spectral energy content of which an effective part is within one restricted frequency band selected from a set of restricted frequency bands ("This speech pattern was filtered using various low-frequency cutoff points of 250, 500, 1000, 2000 and 4000 Hz"; '730 col. 2 lines 32-34) for the benefit of determining loudness levels across certain frequencies using actual words.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the comfort level measurements taught by Hochmair with the use of spoken phrases as taught by Franklin for the benefit of determining loudness levels across certain frequencies using actual words.

**Regarding claim 42,** Hochmair and Franklin remain as applied above.

Hochmair further teaches said portable communication device being a hearing aid ("hearing prosthesis"; '641 title).

**Regarding claim 43,** Hochmair and Franklin remain as applied above.

Hochmair further teaches said portable communication device comprising compensation means for compensation of hearing loss ("hearing prosthesis"; '641 title).

**Regarding claim 44,** Hochmair and Franklin remain as applied above.

Franklin further teaches said test word is chosen according to everyday word usage of said hearing impaired user (*while Franklin teaches one specific phrase used as an example, Franklin states "use of familiar words and phonemes provides test results which reflect more accurately the frequencies at which amplification assistance is desired and the extent of such assistance"; '730 col. 1 lines 44-47*).

**Regarding claim 45,** Hochmair and Franklin remain as applied above.

Hochmair further teaches the said restricted frequency band is a sub-band of the audible frequency band ("frequenc[ies]...from 100 Hz to 3160 Hz"; '641 col. 3 lines 64-66).

**Regarding claim 46,** Hochmair and Franklin remain as applied above.

Hochmair further teaches said restricted frequency band having a width of 1.5 octave[s] (100Hz *approximately corresponds to note G<sub>2</sub> wherein 3160 Hz approximately corresponds to note G<sub>7</sub>, spanning approximately 5 octaves.*)

**Regarding claim 47**, Hochmair and Franklin remain as applied above.

See rejection of claim 46 above, wherein Hochmair teaches said restricted frequency band having a width of one octave.

**Regarding claim 48**, Hochmair and Franklin remain as applied above.

See rejection of claim 46 above, wherein Hochmair teaches said restricted frequency band having a width of 2/3 octave.

**Regarding claim 49**, Hochmair and Franklin remain as applied above.

See rejection of claim 46 above, wherein Hochmair teaches said restricted frequency band having a width of 1/3 octave.

**Regarding claim 50**, Hochmair and Franklin remain as applied above.

Hochmair further teaches said restricted frequency band is a band from 500 Hz to 1 kHz ("frequenc[ies]...from 100 Hz to 3160 Hz"; '641 col. 3 lines 64-66).

**Regarding claim 51**, Hochmair and Franklin remain as applied above.

Hochmair further teaches said restricted frequency band is a band from 250 Hz to 800 Hz ("frequenc[ies]...from 100 Hz to 3160 Hz"; '641 col. 3 lines 64-66).

**Regarding claim 52**, Hochmair and Franklin remain as applied above.

Hochmair further teaches said restricted frequency band is a band from 100 Hz to 500 Hz ("frequenc[ies]...from 100 Hz to 3160 Hz"; '641 col. 3 lines 64-66).

**Regarding claim 53**, Hochmair and Franklin remain as applied above.

Hochmair further teaches said restricted frequency band is a band from 250 Hz to 500 Hz ("frequenc[ies]...from 100 Hz to 3160 Hz"; '641 col. 3 lines 64-66).

**Regarding claim 54**, Hochmair and Franklin remain as applied above.

Hochmair further teaches said restricted frequency band is a band from 1 kHz to 2 kHz ("frequenc[ies]...from 100 Hz to 3160 Hz"; '641 col. 3 lines 64-66).

**Regarding claim 55**, Hochmair and Franklin remain as applied above.

Hochmair further teaches the band of frequencies of 100 Hz to 3160 Hz being exemplary ("an audio range such as from 100 Hz to 3160 Hz"; '641 col. 2 lines 13-14), as well as 'Audio Band' is defined as "between the range of 10 Hz and 17 kHz" ('641 col. 3 lines 7-10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the exemplary range taught by Hochmair with an extended range as

suggested by Hochmair based on the requirements of the design and the specific needs of the patient being tested.

Hochmair further teaches said restricted frequency band is a band from 2 kHz to 4 kHz (e.g. "frequenc[ies]...from 100 Hz to 3160 Hz"; '641 col. 3 lines 64-66).

**Regarding claim 56**, Hochmair and Franklin remain as applied above.

Hochmair further teaches letting the user vary said predetermined attribute until said predetermined perceptual level is achieved ("frequency response adjustment means is used by the patient...for varying the frequency response to obtain a response which is generally uniform in loudness"; '641 col. 2 lines 16-20).

**Regarding claim 57**, Hochmair and Franklin remain as applied above.

Hochmair further teaches the step of evaluating (claim 41) is repeated with several substantial mutually exclusive ("generating the signal in steps"; '641 col. 4 lines 3-4) said restricted frequency bands ("90 logarithmically equally spaced frequency steps"; '641 col. 3 lines 65-66).

**Regarding claim 58**, Hochmair and Franklin remain as applied above.

Hochmair further teaches said hearing impaired user being presented with at least two stimuli signals (SS) ("90 logarithmically equally spaced frequency steps"; '641 col. 3 lines 65-66).



**Regarding claim 59**, Hochmair and Franklin remain as applied above.

Hochmair further teaches said predetermined attribute being a perceptual hearing level ("establishment of a generally uniform response, in loudness"; '641 lines 12-13).

15. Claims 60-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hochmair et al. (US Patent 4,577,641 ('641)) in view of Franklin (US Patent 4,139,730 ('730)) as applied to claim 41 above, and further in view of Ullrich (US PGPub 2002/0126859 ('859)).

**Regarding claim 60**, Hochmair and Franklin remain as applied above.

Neither Hochmair nor Franklin explicitly teach said predetermined attribute being consonant discrimination.

Hochmair does further teach "establishment of a generally uniform response, in...quality" ('641 col. 4 lines 13-14).

In the same field of endeavor, Ullrich teach both "intelligibility" and "clarity" increasing at the higher frequencies (i.e. between about 500 Hz and 5 kHz) ('859 Figs. 3-4).

One of ordinary skill in the art would recognize that this frequency band is largely made up of consonant sounds, wherein most vowel sounds occur at lower frequencies. Therefore, the combination of Hochmair and Franklin, teaching use of familiar words and band-limiting (Franklin) and establishment of "a generally uniform response, in

loudness and quality" (Hochmair) inherently accounts for consonant discrimination by allowing the patient to determine an appropriate "loudness" in the bands wherein consonants lie.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combination of Hochmair and Franklin to further target the higher frequencies, as these frequencies are more useful for speech intelligibility and clarity (due to the consonant concentration in the higher frequencies) as taught by Ullrich.

**Regarding claim 61**, Hochmair and Franklin remain as applied above. Neither Hochmair nor Franklin explicitly teach said predetermined attribute being intelligibility.

Hochmair does further teach "establishment of a generally uniform response, in...quality" ('641 col. 4 lines 13-14).

In the same field of endeavor, Ullrich teach both "intelligibility" and "clarity" increasing at the higher frequencies (i.e. between about 500 Hz and 5 kHz) ('859 Figs. 3-4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combination of Hochmair and Franklin to further target the higher frequencies, as these frequencies are more useful for speech intelligibility and clarity as taught by Ullrich.

**Regarding claim 62**, Hochmair and Franklin remain as applied above.

Neither Hochmair nor Franklin explicitly teach said predetermined attribute being clarity.

Hochmair does further teach "establishment of a generally uniform response, in...quality" ('641 col. 4 lines 13-14).

In the same field of endeavor, Ullrich teach both "intelligibility" and "clarity" increasing at the higher frequencies (i.e. between about 500 Hz and 5 kHz) ('859 Figs. 3-4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combination of Hochmair and Franklin to further target the higher frequencies, as these frequencies are more useful for speech intelligibility and clarity as taught by Ullrich.

**Regarding claim 63,** Hochmair and Franklin remain as applied above.

Neither Hochmair nor Franklin explicitly teach said step of obtaining (claim 41) being repeated with a further predetermined attribute.

Hochmair does further teach "establishment of a generally uniform response, in loudness and quality" ('641 col. 4 lines 13-14).

In the same field of endeavor, Ullrich teach both "intelligibility" and "clarity" increasing at the higher frequencies (i.e. between about 500 Hz and 5 kHz) ('859 Figs. 3-4), though "intelligibility" and "clarity" are not the same measurement, and therefore have separate peaks. The combination of Hochmair and Franklin teaches using familiar words as stimuli to patients. Those words are bandlimited, wherein the band is "swept"

up over a typical auditory band. As "intelligibility" and "clarity" have separate frequency response curves, "sweeping" the frequency of the stimulus will inherently target a "further predetermined attribute"; wherein the combination teach attributes including "loudness", "intelligibility", "clarity", and "consonant discrimination".

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combination of Hochmair and Franklin to further target the higher frequencies, as these frequencies are more useful for speech intelligibility and clarity as taught by Ullrich.

### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Slavin (US Patent 4,489,610) teaches a computerized audiometer.
- b. Engebretson et al. (US Patent 4,548,082) teaches programming hearing aides, including speech intelligibility and other patient customizations.
- c. Rohrer et al. (US Patent 3,989,904) teaches a method and apparatus for setting an aural prosthesis to provide custom corrections.
- d. Voroba et al. (US Patent 4,759,070) teaches a patient controlled master hearing aid.
- e. Davis et al. (US Patent 6,201,875) teaches a hearing aid fitting system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSE A. ELBIN whose telephone number is (571)270-3710. The examiner can normally be reached on Monday through Friday, 9:00am to 6:00pm EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on (571) 272-7499. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. A. E./  
Examiner, Art Unit 2614

/CURTIS KUNTZ/

Supervisory Patent Examiner, Art Unit 2614